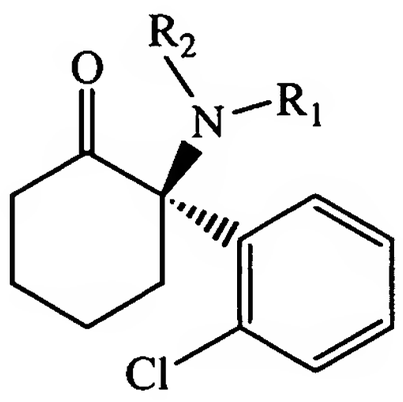
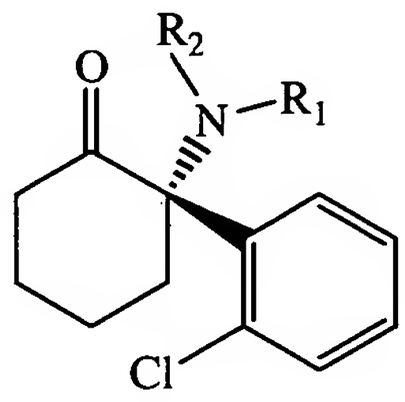
Claims:

What is claimed is:

1. A method for treating pain in a subject comprising administering to a subject in need thereof an effective amount of a compound of formula 1 or formula 2



1



2

wherein:

R_1 = Methyl, R_2 = CH_2OCOR_3

R_1 = H, R_2 = CH_2OCOR_3

R_1 = Methyl, R_2 = CH_2COOR_3

R_1 = H, R_2 = CH_2COOR_3

R_1 = Methyl, R_2 = $COOR_3$

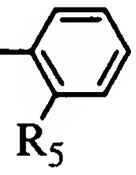
R_1 = H, R_2 = $COOR_3$

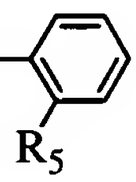
R_1 = Methyl, R_2 = $COOCH_2CH_2N(CH_3)_2$

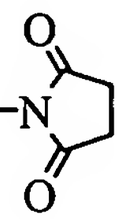
R_1 = H, R_2 = $COOCH_2CH_2N(CH_3)_2$

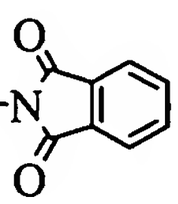
R_1 = Methyl, R_2 = $COOCH(R_3)OCOR_4$

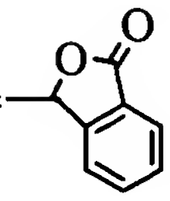
R_1 = H, R_2 = $COOCH(R_3)OCOR_4$

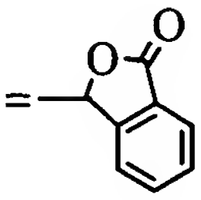
R_1 = Methyl, R_2 = CH_2NHCO– 

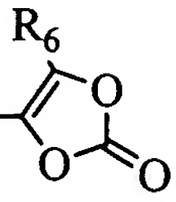
R_1 = H, R_2 = CH_2NHCO– 

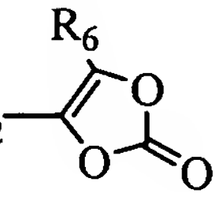
R_1 = H, R_2 = CH_2– 

R_1 = H, R_2 = CH_2– 

R_1 = Methyl, R_2 = 

R_1 = H, R_2 = 

R_1 = Methyl, R_2 = CH_2 

R_1 = H, R_2 = CH_2 

and wherein R_3 and R_4 are phenyl, aryl, azaaryl, alkyl, branched alkyl, cycloalkyl, alkenyl, cycloalkenyl; where R_5 = OH or SH;
and where R_6 = alkyl, branched alkyl; or a
racemic mixture of compounds of formula 1 and formula 2 in which R_1 = H and R_2 can be any of the groups recited above for R_2, including H; and
pharmaceutically acceptable salts and solvates thereof.

2. The method according to Claim 1, wherein said compound is (±) norketamine, S-norketamine, R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

3. The method according to Claim 1, wherein said compound is a prodrug of (±) norketamine, a prodrug of (±) ketamine, a prodrug of S-ketamine, a prodrug of R-ketamine, a prodrug of S-norketamine, or a prodrug of R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

4. The method of Claim 3, wherein said compound is:

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid ethyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid isopropyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid butyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid phenyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid benzyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexylamino]-acetic acid ethyl ester;

or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

5. The method according to Claim 1, wherein said effective amount of said compound is about 1% to about 50% of an amount used to induced anesthesia.

6. The method according to Claim 1, wherein said effective amount of said compound is about 5% to about 40% of an amount used to induced anesthesia.

7. The method according to Claim 1, wherein said effective amount of said compound is about 10% to about 20% of an amount used to induced anesthesia.

8. The method according to Claim 1, wherein said effective amount of said compound is about 0.01 to about 20 mg/kg of body weight

9. The method according to Claim 1, wherein said effective amount of said compound is about 0.05 to about 8 mg/kg of body weight.

10. The method according to Claim 1 wherein said pain is breakthrough pain or pain associated with wind-up.

11. The method according to Claim 1 wherein said pain is pain associated with labor and/or childbirth.

12. The method according to Claim 1 wherein said pain is chronic pain or neuropathic pain.

13. The method according to Claim 1, wherein said effective amount of said compound is administered over a 24 hour period.

14. The method according to Claim 1, wherein said effective amount of said compound is administered in conjunction with a narcotic analgesic effective to alleviate pain.

15. The method according to claim 14, further comprising decreasing a dose of the narcotic analgesic.

16. A method for self-treating pain in a subject comprising self-administering on an outpatient basis via one or more of the transmucosal, transdermal, nasal, oral, or pulmonary routes, or any combination thereof, about 0.01 to about 20 mg/kg of body weight of a compound of Claim 1 which is effective to alleviate pain.

17. The method of Claim 16 wherein an effective amount of said compound is determined by a physician or medical care provider to be below a level that induces dysphoria.

18. The method according to Claim 16, wherein said compound is (±) norketamine, S-norketamine, R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

19. The method according to Claim 16, wherein said compound is a prodrug of (±) norketamine, a prodrug of (±) ketamine, a prodrug of S-ketamine, a prodrug of R-ketamine, a prodrug of S-norketamine, or a prodrug of R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

20. The method of Claim 19, wherein said compound is:

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid ethyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid isopropyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid butyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid phenyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid benzyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexylamino]-acetic acid ethyl ester;

or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

21. The method according to Claim 16, wherein said effective amount of said compound is about 1% to about 50% of an amount used to induced anesthesia.

22. The method according to Claim 16, wherein said effective amount of said compound is about 5% to about 40% of an amount used to induced anesthesia.

23. The method according to Claim 16, wherein said effective amount of said compound is about 10% to about 20% of an amount used to induced anesthesia.

24. The method according to Claim 16, wherein said effective amount of said compound is about 0.01 to about 20 mg/kg of body weight

25. The method according to Claim 16, wherein said effective amount of said compound is about 0.05 to about 8 mg/kg of body weight.

26. The method according to Claim 16 wherein said pain is breakthrough pain or pain associated with wind-up.

27. The method according to Claim 16 wherein said pain is pain associated with labor and/or childbirth.

28. The method according to Claim 16 wherein said pain is chronic pain or neuropathic pain.

29. The method according to Claim 16 wherein said effective amount of said compound is administered over a 24 hour period.

30. The method according to Claim 16 wherein said effective amount of said compound is administered in conjunction with a narcotic analgesic effective to alleviate pain.

31. The method according to Claim 29 further comprising decreasing a dose of the narcotic analgesic.

32. A device for patient self-administration of a compound of Claim 1 on an outpatient basis comprising a nasal applicator containing a formulation of said compound and a pharmaceutically acceptable vehicle, wherein the device is metered to disperse an amount of the formulation that contains a dose said compound which is effective to alleviate pain.

33. The device according to Claim 32, wherein said compound is (±) norketamine, S-norketamine, R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

34. The device according to Claim 32, wherein said compound is a prodrug of (±) norketamine, a prodrug of (±) ketamine, a prodrug of S-ketamine, a prodrug of R-ketamine, a prodrug of S-norketamine, or a prodrug of R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

35. The device of Claim 34, wherein said compound is:

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid ethyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid isopropyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid butyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid phenyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid benzyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexylamino]-acetic acid ethyl ester;

or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

36. The device according to Claim 32, wherein said effective amount of said compound is about 1% to about 50% of an amount used to induced anesthesia.

37. The device according to Claim 32, wherein said effective amount of said compound is about 5% to about 40% of an amount used to induced anesthesia.

38. The device according to Claim 32, wherein said effective amount of said compound is about 10% to about 20% of an amount used to induced anesthesia.

39. The device according to Claim 32, wherein said effective amount of said compound is about 0.01 to about 20 mg/kg of body weight

40. The device according to Claim 32, wherein said effective amount of said compound is about 0.05 to about 8 mg/kg of body weight.

41. The device according to Claim 32 wherein said pain is breakthrough pain or pain associated with wind-up.

42. The device according to Claim 32 wherein said pain is pain associated with labor and/or childbirth.

43. The device according to Claim 32 wherein said pain is chronic pain or neuropathic pain.

44. The device according to Claim 32 wherein said effective amount of said compound is administered over a 24 hour period.

45. The device according to Claim 32 wherein said effective amount of said compound is administered in conjunction with a narcotic analgesic effective to alleviate pain.

46. The device according to Claim 45 further comprising decreasing a dose of the narcotic analgesic.

47. The device of Claim 32, wherein the vehicle comprises a dispersant.

48. The device of Claim 47, wherein the dispersant is a surfactant.

49. The device of Claim 32, wherein the formulation is a dry powder formulation

50. The device of Claim 49, wherein the compound is present as a finely divided powder and further comprises a bulking agent.

51. The device of Claim 50 wherein the bulking agent is selected from the group consisting of lactose, sorbitol, sucrose and mannitol.

52. The device of Claim 32, wherein the formulation is a liquid formulation further comprising a pharmaceutically acceptable diluent.

53. The device of Claim 52 wherein the diluent is selected from the group consisting of sterile water, saline, buffered saline and dextrose solution.

54. A device for patient self-administration of a compound of Claim 1 on an outpatient basis comprising a transdermal patch containing a formulation of said compound and a pharmaceutically acceptable transdermal carrier wherein the device is metered to disperse an amount of the formulation effective to alleviate pain.

55. The device according to Claim 54, wherein said compound is (±) norketamine, S-norketamine, R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

56. The device according to Claim 54, wherein said compound is a prodrug of (±) norketamine, a prodrug of (±) ketamine, a prodrug of S-ketamine, a prodrug of R-ketamine, a prodrug of S-norketamine, or a prodrug of R-norketamine, or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

57. The device of Claim 54, wherein said compound is:

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid ethyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid isopropyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid butyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid phenyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid benzyl ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexylamino]-acetic acid ethyl ester;

or any combination thereof, or any pharmaceutically acceptable salts or solvates thereof.

58. The device according to Claim 54 wherein said effective amount of said compound is about 1% to about 50% of an amount used to induced anesthesia.

59. The device according to Claim 54 wherein said effective amount of said compound is about 5% to about 40% of an amount used to induced anesthesia.

60. The device according to Claim 54 wherein said effective amount of said compound is about 10% to about 20% of an amount used to induced anesthesia.

61. The device according to Claim 54 wherein said effective amount of said compound is about 0.01 to about 20 mg/kg of body weight

62. The device according to Claim 54 wherein said effective amount of said compound is about 0.05 to about 8 mg/kg of body weight.

63. The device according to Claim 54 wherein said pain is breakthrough pain or pain associated with wind-up.

64. The device according to Claim 54 wherein said pain is pain associated with labor and/or childbirth.

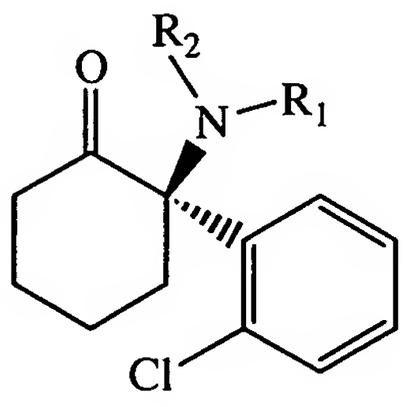
65. The device according to Claim 54 wherein said pain is chronic pain or neuropathic pain.

66. The device according to Claim 54 wherein said effective amount of said compound is administered over a 24 hour period.

67. The device according to Claim 54 wherein said effective amount of said compound is administered in conjunction with a narcotic analgesic effective to alleviate pain.

68. The device according to claim 67 further comprising decreasing a dose of the narcotic analgesic.

69. A compound of formula 1 or formula 2



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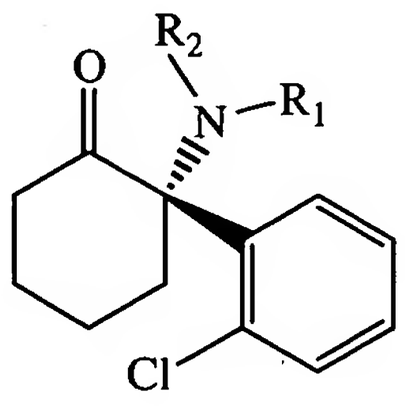


2

wherein:

R_1 = Methyl, R_2 = CH_2OCOR_3

R_1 = H, R_2 = CH_2OCOR_3

R_1 = Methyl, R_2 = CH_2COOR_3

R_1 = H, R_2 = CH_2COOR_3

R_1 = Methyl, R_2 = $COOR_3$

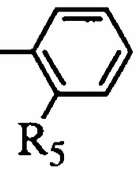
R_1 = H, R_2 = $COOR_3$

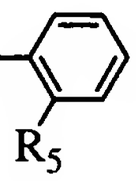
R_1 = Methyl, R_2 = $COOCH_2CH_2N(CH_3)_2$

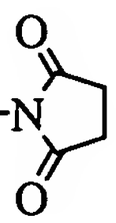
R_1 = H, R_2 = $COOCH_2CH_2N(CH_3)_2$

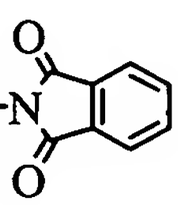
R_1 = Methyl, R_2 = $COOCH(R_3)OCOR_4$

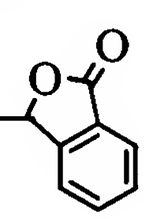
R_1 = H, R_2 = $COOCH(R_3)OCOR_4$

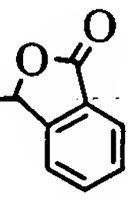
R_1 = Methyl, R_2 = CH_2NHCO– 

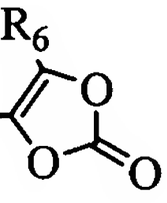
R_1 = H, R_2 = CH_2NHCO– 

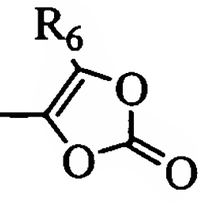
R_1 = H, R_2 = CH_2– 

R_1 = H, R_2 = CH_2– 

R_1 = Methyl, R_2 = 

R_1 = H, R_2 = 

R_1 = Methyl, R_2 = CH_2– 

R_1 = H, R_2 = CH_2– 

and wherein R_3 and R_4 are phenyl, aryl, azaaryl, alkyl, branched alkyl, cycloalkyl, alkenyl, cycloalkenyl; where R_5 = OH or SH;
and where R_6 = alkyl, branched alkyl; or a
racemic mixture of compounds of formula 1 and formula 2 in which R_1 = H and R_2 can be any of the groups recited above for R_2, excluding H; and pharmaceutically acceptable salts and solvates thereof.

70. The compound of Claim 54, wherein said compound is:

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid ethyl

ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid isopropyl

ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid butyl

ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid phenyl

ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexyl]-carbamic acid benzyl

ester;

[1-(2-Chloro-phenyl)-2-oxo-cyclohexylamino]-acetic acid ethyl

ester;

or any pharmaceutically acceptable salts or solvates thereof.